The death of his wife last year was a blow to him, from which he never seemed quite to recover. Yet at the Centenary of the Institute of France, last October, he took his part in the various functions, save those that required evening attendance. He accompanied the excursionists to Chantilly, and was welcomed there by the Duc d'Aumale as an old colleague and personal friend. He began to be somewhat ailing before Easter, and though for a time he appeared to rally, and hopes were entertained that his life might still be prolonged, he died peacefully on May 29, at his house in the Boulevard St. Germain.

A courteous and polished gentleman of the old school, M. Daubrée was everywhere a favourite. There was a certain gentle timidity of manner which gave him a peculiar charm. To those privileged with his friendship he was a warm-hearted kindly benefactor who never spared himself trouble to do a kind act, and to give proofs of the depth of his affectionate nature. A. G.

NOTES.

AT the annual meeting of the Royal Society for the election of Fellows, held on Thursday last, in the Society's rooms in Burlington House, the following gentlemen were elected into the Society:—Lieut.-Colonel Sir George Sydenham Clarke, R.E., Dr. J. Norman Collie, Dr. Arthur Matthew Weld Downing, Dr. Francis Elgar, Prof. Andrew Gray, Dr. George Jennings Hinde, Prof. Henry Alexander Miers, Dr. Frederick Walker Mott, Dr. John Murray, Prof. Karl Pearson, Rev. Thomas Roscoe Rede Stebbing, Prof. Charles Stewart, Mr. William E. Wilson, Mr. Horace Bolingbroke Woodward, and Dr. William Palmer Wynne. The investigations made by each of the new Fellows are set forth in the certificates printed in our issue of May 7.

A DISTINGUISHED philosopher, a wonderful orator, and a mind that was always on the side of advancement in science, art and literature, has been lost to France by the death of M. Jules Simon. He was a great educational reformer, and his voice and pen were always ready to support those things which make for the peace and progress of the world. At the celebration of the Centenary of the Institute of France, last October, he delivered a remarkable discourse, which was printed in full in these columns. His concluding words reflect the broadness of his mind so well, that they may be appropriately repeated now. "Associés et correspondants de l'Institut de France, vous n'emporterez pas seulement d'ici le souvenir des chaleureuses sympathies qui vous ont accueillis. Nous emporterons tous, de cette réunion fraternelle, un redoublement d'amour pour la paix, pour les sciences qui la fécondent et pour les arts qui l'embellissent; et nous travaillerons, chacun dans notre coin préféré de l'atelier universel, a la prospérité de la maison, c'est-à-dire au bonheur de l'humanité." The French Chamber has shown its appreciation of Jules Simon's services in the interests of humanity by voting ten thousand francs for a public funeral, and this has been unanimously agreed to by the Senate.

DR. ROUX has been elected an associate of the Academy of Medicine, in the room of the late M. Pasteur.

SIR GEORGE STOKES and Dr. Carl L. Griesbach, Director of the Geological Survey of India, have been elected honorary members of the Austrian Academy of Sciences.

THE annual conversazione of the Institution of Electrical Engineers will be held in the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly, on the evening of Thursday, June 25.

AN agricultural bacteriological laboratory will shortly be opened at St. Petersburg, under the Ministry of Agriculture and State's Domains. Its chief purpose will be the study of the micro-organisms which are harmful to agriculture, and the pursuit of scientific studies in bacteriology. The laboratory is endowed with a yearly grant of 10,000 roubles (£1000) from the Treasury of the State.

THE members of M. Andrée's balloon expedition to the North Pole left Gothenburg on Sunday, June 7, on board the steamer *Virgo*, bound for Spitzbergen.

OWING to some difficulty in connection with the preparations for his new expedition to Greenland, Lieutenant Peary will be unable to come to England as he intended. The meeting of the Royal Geographical Society on Tuesday, June 16, at which he was to read a paper, will, therefore, not be held.

THE steam yacht *Windward* left St. Katharine's Docks on Tuesday with a very large supply of provisions, a number of sledges, and two additional members for the Franz-Josef Land party of the Jackson-Harmsworth Expedition. It is hoped that she will communicate with the explorers at Cape Flora, Franz-Josef Land, on or about July 20. As soon as the *Windward* has discharged her cargo, she will leave Franz-Josef Land with news of the doings of the explorers, and she may be expected in England by the end of September. About this time next year, if all has gone well, the ship will leave London again to bring the explorers home.

WE regret to record the death of Sir George Johnson, F.R.S., at the age of seventy-eight. He obtained his medical education in King's College Medical School, with which institution his life's work is intimately associated; for at different times he there filled the posts of medical tutor, professor of materia medica and therapeutics, professor of the principles and practice of medicine, and professor of clinical medicine. He was the author of numerous works and papers on medical subjects, the best-remembered of which will probably be those on cholera, epidemic diarrhœa, and Bright's disease. A melancholy interest is attached to the fact that his last work, on "The Pathology of the Contracted Granular Kidney," was published the day before his death. He was elected a Fellow of the University of London in 1862, and was admitted into the Royal Society ten years later.

TOWARDS the end of a long and highly appreciative notice of the life and works of the late Sir J. Russell Reynolds, whose death we briefly recorded last week, the *British Medical Journal* thus refers to the scholarly address which he delivered as president of the successful meeting of the British Medical Association held in 1895:—"His presidential address, as the last important public utterance of a distinguished man, has now a double interest. As we reperuse it we seem to read the departing words of a veteran to whom the sunset of life had already given mystical lore, and whose admonitions to those who shortly will reign in his room have assumed oracular force. At the end of a span of years greater than is usually allotted to men of our calling, he looks with calm survey over a period the most pregnant with scientific progress the world has ever yet known. In a series of terse, closely reasoned passages he points out the vast changes that have occurred in the entire theory and method of physic since he first set foot in a hospital ward, rejoicing in the advances made, warning his successors against the errors and defects that those very advances may beget. Science is great, wisdom is greater; the ampler the armament of knowledge, the more need to strengthen and train the mind by which it must be carried, the judgment by which it must be exercised; such is the constant moral of Sir Russell Reynolds's final utterance to the medical world. Was it in a spirit of prophecy that he warned the subject-ridden student of to-day of the danger of becoming entangled in the net of an ill-considered and misunderstood technical phraseology, and of juggling with words when he ought to be dealing with concrete things? It was at least the warning of a man, rarer among us as the generations proceed, who had seen both sides of the intellectual shield; who was at once a scholar and a scientific physician."

THE Royal Medals and other awards made by the Royal Geographical Society for the encouragment of geographical science and discovery have, reports the *Geographical Magazine*, been assigned as follows:—The founder's medal, to Sir William Macgregor, for his long-continued services to geography in British New Guinea, in exploring and mapping both the interior and the coast-line, and in giving information on the natives; the patron's medal, to Mr. St. George R. Littledale, for his three important journeys in the Pamirs and Central Asia; the Murchison grant, to Yusuf Sharif Khan Bahadur, Native Indian Surveyor, for his work in Persian Baluchistan and elsewhere; the Gill memorial, to Mr. A. P. Low (of the Canadian Survey), for his five explorations in Labrador; the Back grant, to Mr. J. Burr Tyrrell (of the Canadian Survey), for his two expeditions in the Barren Ground of North-East Canada; and the Cuthbert Peek grant, to Mr. Alfred Sharpe, for his journeys during several years in Central Africa. The following geographers have been elected honorary corresponding members of the Society: M. P. de Semenoff, Vice-President of the Russian Geographical Society; Prof. Dr. Karl von den Steinen, President of the Berlin Geographical Society; Prof. Dr. G. Neumayer, Director of the Naval Observatory, Hamburg; Prof. A. de Lapparent, late President of Council of the Paris Geographical Society; Dr. Albrecht Penck, Professor of Geography in Vienna University; Prof. Dr. Otto Petterson, of Stockholm, the distinguished oceanographer; Prof. Dr. Kan, President of the Dutch Geographical Society; Sr. D. Ernesto do Canto, of São Miguel, Azores, who has edited a series of the Archives of the Azores; Prof. H. Pittier, Director of the National Physico-Geographical Institute of Costa Rica.

THE preliminary announcement of the Local Committee of the American Association for the Advancement of Science for the forty-fifth meeting, being the fourth Buffalo meeting, has just been issued. The meeting of the Association itself will be held August 24-28, and affiliated societies will begin their meetings on August 20, and will continue till September 1. On Monday morning, August 24, the retiring President, Prof. Edward W. Morley, will introduce the President-elect, Prof. Edward D. Cope. On Monday afternoon the several Vice-Presidents will deliver their annual addresses as follows:—Carl Leo Mees, before the section of physics, on "Electrolysis and some outstanding Problems in Molecular Dynamics"; Alice C. Fletcher, before the section of anthropology, on "Emblematic Use of the Tree in the Dakotan Group"; Ben. K. Emerson, before the geological section, on "Geological Myths"; Wm. E. Story, before the section of mathematics and astronomy, on "Intuitive Methods in Mathematics"; William R. Lazenby, before the section of social and economic science, on "Horticulture and Health"; Theodore N. Gill, before the section of zoology, on "Animals as Chronometers for Geology"; Wm. A. Noyes, before the section of chemistry, on "The Achievements of Physical Chemistry"; Nathaniel L. Britton, before the botanical section, on "Botanical Gardens"; Frank O. Marvin, before the section of mechanical science and engineering, on "The Artistic Element in Engineering." Prof. F. W. Putman is Permanent Secretary of the Association, and Eben P. Dorr, of Buffalo, is the Local Secretary for this meeting.

THE Geological Society of America will have a series of excursions before the meeting of the American Association, and will hold a business meeting on Saturday evening, August 22, at which papers will be presented by title, which are to be read and discussed in the geological section in the following week. This is a departure from the custom of previous years, when papers read before this Society detracted from the material presented to the geological section. Prof. Joseph Le Conte is President. Other affiliated societies, which meet two or three days before the General Association, are the American Chemical Society (Dr. Charles B. Dudley, President), Society for the Promotion of Agricultural Science (Prof. Wm. R. Lazenby, President), Association of Economic Entomologists (Prof. C. H. Fernald, President), Botanical Society of America (Prof. Charles E. Bessey, President), Society for the Promotion of Engineering Education (Prof. Mansfield Merriman, President). A meeting of the American Mathematical Society will be held after the close of the Association meeting.

FROM a circular recently distributed we learn that Mr. W. Garstang, Fellow of Lincoln College, Oxford, will again conduct a vacation course of study in marine biology at the Plymouth laboratory during the ensuing summer, from July 23 to August 22, inclusive. Students who may desire to join the class should apply to Mr. Garstang before the end of the current month.

IN a contribution to the current number of the *Biologisches Centralblatt*, Dr. Imhof records some observations upon the effects of introducing eels into certain Alpine lakes which seem to him to discredit the generally received opinion that the fresh-water eel spawns only in the sea. The reproduction of the eel is a mystery which has hitherto baffled all attempts at solution; and naturalists may perhaps find some clue to the successful elucidation of the problem in Dr. Imhof's communication. It appears that eels were first introduced into three small Alpine lakes in canton Graubünden in the year 1882. In two of the ponds the fish apparently died; but in the Caumasee they flourished. Extensive additions were made to the stock in the lake in 1887. The eels still thrive well there and attain a length of 1·3 metres. No additions have been made to the stock since 1887, so that all the original eels must be at least eight or nine years old at the present time. Nevertheless, it was discovered last year that young eels were present in the lake; and the knowledge that both sexes are represented there, combined with this discovery, has led Dr. Imhof to the conclusion that the eels introduced into the Caumasee have multiplied in the lake itself. It should be mentioned that the Caumasee is 1000 metres above sea-level, has no apparent outlet, and is fed almost exclusively by subterranean springs. It seems improbable that the presence of the young eels can be due to natural immigration.

AT the recent annual meeting of the Selborne Society, Sir William Flower delivered an interesting address, which is printed in the June number of *Nature Notes*. In the course of his remarks he traced the rise and fall of local museums, and pointed a moral which cannot be too widely known. He said:—"A museum is started or established in some country town, a building is appropriated, various things are brought together, and the people who have done this think they have done a great thing towards cultivating a love for natural history. But in twenty or thirty years when you go again to that place, you will see the building and most of the specimens, but in such a condition that you might well think that the inscription 'Rubbish may be shot here' should be over the doorway. There are a few exceptions here and there, of course, but the principal reason is that when people start a museum they forget one thing. If you were starting a school the first thing you would think of would be the schoolmaster. A church is of no use without a minister; a garden is of no good without a gardener. None of these things are expected to take care of themselves, yet that is what *is* expected of nearly all the museums in the country. They are set up and the exhibits are arranged, but the last thing anybody seems to think anything about is the curator. A curator is the heart and soul of a museum, and yet we have museums going to decay because nobody thought of the expense that is needful to keep a curator and his staff going. If the thousands, aye, tens of thousands, which have been spent on so-called technical education had only been spent in founding really good local museums—places where any one wishing to know about any bird, or stone, or plant, might go and see for themselves—for I maintain that a museum in its proper sense should be a place of instruction, not merely showing things stuffed and dried like miserable mummies, but giving instruction as to its nature and habit, and any other we might wish to know—what an immense store of useful information would have been gained."

PITHECANTHROPUS is still to the fore. Early this year the Royal Dublin Society published the paper Dr. Dubois read before that Society (*cf.* NATURE, No. 1362, vol. liii., 1895, p. 115), and now he has published a further communication in the *Anatom. Anzeiger* (vol. xii. p. 1), with several illustrations, in which he reiterates his conclusions. A table is given of nineteen anatomists who are classed according to whether they believe Pithecanthropus to be a simian, human, or transitional form; but we imagine that some may object to be tabulated in this form. It is a pity that the ideal reconstruction of the cranium on p. 15, should require to be corrected in two points. Dr. R. Martin has also published a small pamphlet on "further remarks on the Pithecanthropus question," in which he quotes the opinion of a large number of writers on the subject, and particularly lays himself out to attack Virchow; he believes that it is "a low variety of the species *homo*." M. L. Manouvrier concludes in the current number of the *Bull. Soc. d'Anthrop. Paris* (vi. 4^e sér. fasc. 6) his erudite "Deuxième étude sur le *Pithecanthropus erectus* comme précurseur présumé de l'homme." This is the most searching scrutiny to which the remains have been subjected, and it forms the most important contribution to the general discussion. It will be remembered that the Javan femur is very human in its characters, the only non-typical differences (putting aside the pathological bony outgrowth) being in the popliteal region. M. Manouvrier has thoroughly discussed this point after having examined several hundred femora, and he finds that the femur of Pithecanthropus fits in a series with normal human femora, and it is not more simian than human; the peculiar variation of the Javan femur is associated with a weak musculature, and the latter may possibly be partly due to the pathological condition already noted; when another femur is discovered, it may be yet more human than this one. In his discussion on the skull, M. Manouvrier gives three alternative ideal restorations and several other comparative diagrams, and he comes to the conclusion that "the Trinil race has arisen from a race of species of very short stature." This is very important from a theoretical point of view; and, with the evidence now to hand, there seem to be grounds for believing that in the evolution of man the femur assumed its human characters in advance of the skull. M. Manouvrier denies that this is a case of microcephaly, and believes that the "missing link" has been found.

REPRODUCTIONS of the decorative artistic efforts of primitive folk are always of great value provided they are perfectly accurately copied. Mr. R. L. Jack, the Government Geologist of Queensland, has recently published a plate or reproductions of aboriginal cave-drawings from the Palmer Gold Field (*Proc. Roy. Soc. Queensland*, xi.), and though we welcome all signs of interest taken in native matters, we cannot but feel some suspicion in the present instance, as there are discrepancies between the figures and the text in certain details. Reproductions of aboriginal drawings lose almost the whole of their value unless the strictest accuracy is preserved. We hope that our colonial scientific societies will publish as many exact transcriptions of native art as they can obtain from travellers, before it is too late.

PROF. R. SEMON, of Jena, whose brilliant investigations on the development of Ceratodus and the Monotremes has already been referred to in these pages, has also turned his attention to the Anthropology of Australia. We cull from our contemporary *Die Natur* (1896, No. 20) the conclusions to which Dr. Semon has arrived respecting the vexed question of the origin of this people. As to culture grade the Australians are ranked above the Veddas, and slightly below the African Pigmies and the Bushmen; the Fuegans are of about the same grade, but the natives of Brazil and the Eskimo are higher. The Australians and Dravidians of India belong to one of the main stems of humanity. The Veddas of Ceylon, judging from the investigations of the Sarasins, belong to a small Pre-Dravidian branch; these arose at a low-culture grade, and have not made any progress since. Other early branches of the primitive Dravido-Australian stem seem to be the curious Ainus of Japan, and the Khmers and Chams of Cambodja. The White Race ("Caucasian") probably came from the Dravidian branch, and thus we Europeans are related to the low savages of Australia; very distantly, it is true, but these are nearer to us than are the Negroes, Malays, or Mongols. It may be noted that these conclusions of Prof. Semon's agree pretty closely with opinions expressed by several English anthropologists.

DR. WESLEY MILLS, Professor of Physiology in McGill University, Montreal, has recently published in the *Transactions* of the Royal Society of Canada (second series, section iv. vol. i. pp. 191-252) a series of papers on the psychic development of young animals. A year earlier, Dr. Mills published the first paper of the series dealing with the psychic development of the dog (St. Bernard and Bridlington terrier). This is now supplemented by observations on the cat, mongrel dog, rabbit, and guinea-pig, and, among birds, the pigeon and the chick. The records are in the form of diaries, from which comparisons and conclusions are then drawn. There is so little systematic record of observations on the instincts and habits of young mammals, that Dr. Wesley Mills' papers are especially welcome. Dr. Mills has also contributed to a discussion on instinct in the correspondence columns of *Science* during the last few weeks, in which Prof. Mark Baldwin also took part. Prof. Baldwin's letters (March 20 and April 10) and Dr. Mills' criticism (May 22) should be read by those interested in the interpretation of the phenomena of instinct in the light of modern theories of heredity.

DURING the last six or seven years, the observation of the pulsations from distant earthquakes has been facilitated by the invention of delicate instruments, such as the horizontal and bifilar pendulums and the long vertical pendulums used in Italy. The investigation of these interesting phenomena suffers, however, from two or three serious disadvantages, which can hardly be removed except by some form of combined action. The instruments employed are of several different types, and they are very unequally scattered over the earth's surface. Many pulsations, again, are recorded which, though of the usual seismic character, cannot be traced to any known earthquake, there being many countries where no regular organisation exists for the study of these disturbances. We are therefore glad to draw attention to a circular issued by Prof. Gerland, of Strassburg, and signed by nearly all the leading seismologists. Starting from Japan, which possesses the most complete organisation for the study of earthquakes, they suggest a number of stations at which it is desirable that observations should be made. These stations are distributed as uniformly as possible over the earth's surface, and the following places are indicated as especially suitable:—Shanghai, Hongkong, Calcutta, Sydney, Rome, Tacubaya (Mexico), Port Natal, Cape of Good Hope, Santiago (Chili), and Rio de Janeiro. The horizontal pendulum of von Rebeur-Paschwitz is, in the first place, recommended for adoption. As a necessary supplement, it is proposed to form a centre for the collection and publication of reports on the earthquakes of the whole world. These are to be issued as supplements to Gerland's "Beiträge zur Geophysik." They will contain accounts of all earthquakes strong enough to damage well-built houses, and will give in each case the most exact details that can be obtained with reference to the position of the epicentre and the time-records at places adjoining it. Lists are also to be published of all earthquake pulsations registered by the horizontal and other pendulums. The scheme, for which we are chiefly indebted to the late Dr. E. von Rebeur-Paschwitz, can hardly fail to add greatly to our knowledge of earthquakes and their nature, even if it should have to be carried out on a scale less extensive than that now planned.

AN interesting series of experiments on the transparency of liquids is described by M. W. Spring in the *Bulletin* of the Royal Academy of Belgium. The first of M. Spring's papers deals with the colours of the alcohols as compared with water. None of the alcohols observed were colourless when the thickness of fluid was 26 metres; methyl alcohol appeared greenish blue, ethyl alcohol the same, but of a less warm colour, and amyl alcohol greenish yellow. The pure blue colour observed in water becomes thus modified by the admixture of more and more yellow as we pass from one term of the homologous series of compounds to the next. The absorbing powers of the various liquids for ordinary light were also observed, and it was found that these formed a descending series, the simplest substance, water, offering the greatest resistance to the passage of light seen by the eye. In a second contribution, the same writer discusses the temperature at which the connection currents begin to produce opacity in a column of water of given length. Where the length is 26 metres the smallest difference of temperature that will suffice is about 0°·57, and is comparable with that which doubtless exists in lakes and seas. The author concludes that we have here an explanation of the varied colours so often seen on water. These result from the differences of temperature caused by sunshine, on the one hand, and by the cooling action of wind blowing on the surface, on the other.

IN NATURE of June 4, reference was made to a report from Missouri bearing on the question, "Do Röntgen rays exercise any influence on bacteria?" This question forms the title of a paper by Prof. G. Sormani (*Rendiconti del Reale Istituto Lombardo*), in which are described experiments made on sixteen different species of bacteria, both in cultures and when inoculated into living animals. As a result of these experiments, the author has to admit that Röntgen rays do not exercise any sensible action on the cultural and pathogenic properties of the bacteria on which he has experimented.

M. GASPAR SCHMITZ (*Bulletin de l'Académie Royale de Bélgigue*) describes, with diagrams, a fine group of thirty-two upright tree trunks which were discovered in November last on the top of the coal-bearing strata in the Liège basin. There are two theories to account for the existence of these trunks, viz. growth on the spot, or transportation from a distance; and from the evidence derived from careful examination of the surroundings, M. Schmitz appears, however, to incline to the latter theory.

THE Deutsche Seewarte has issued the tenth yearly series of Daily Synoptic Weather Charts for the North Atlantic Ocean, prepared in conjunction with the Danish Meteorological Institute. The charts are drawn for each morning from December 1, 1890, to November 30, 1891, and embrace a large portion of the adjoining continents of Europe and America. The explanatory text, issued in separate quarterly parts, shows (1) the paths of all barometric minima, or areas of low pressure, with indications of the intensity of the depressions; (2) the positions and the changes of locality of the barometric maxima, or areas of high pressure; (3) the mean position of the isobar of 765 mm. (30·1 inches) for certain definite periods. We have before expressed our opinion that the value of this and similar laborious undertakings for the purpose of investigating the laws which underlie our weather changes, most of which reach us from the Atlantic, can hardly be over-estimated.

THE Hydrographic Office of the United States continues the publication and wide distribution of its monthly Pilot Charts for the North Pacific Ocean. These charts contain much information of especial value to seamen, and show the mean average conditions of atmospheric pressure, winds and storms, the positions of areas of high and low barometer, and the principal sailing routes over that ocean. The chart for May last contains the track and log of the American schooner *Aida*, which recently made the passage from Shanghai to Port Townsend, Washington State, in the remarkably short period of twenty-seven days. This passage is an excellent example of what may be accomplished by a captain who takes advantage of existing meteorological conditions and of the information afforded by the Pilot Charts. In the case in point the conditions were certainly favourable, but not exceptionally so.

LIMITS of space prevent us from reviewing, or even enumerating, the whole of the articles in several bulky volumes recently received; all we can do is to direct attention to their publication. The annual of the Bergen Museum—"Bergen's Museums Aarbog"—for 1894–95 contains numerous papers on physical and natural science, archæology and history, printed in Norsk, German, and French. Among the subjects of the papers are:—Results of cross-fertilisation of fishes, the systematic ennumeration of the marine polyzoa of Norway, the geology of the glacier of Hardanger, the geology and archæology of the plateau of Hardanger, ichthyological notices, foraminifera collected near Bergen during 1894, the decomposition of albuminoids in the human organism, echinoderm fauna in the western fiords, mosses of the Sandefiord region, a certain differential equation, and algæ of the western coast of Norway. The volume also contains reports of the collections and work of the Museum during 1894 and 1895. The "Sitz. der königl. bohmischen Gesellschaft der Wissenschaften at Prague," for 1895, comes to us in two volumes, each filled with papers of scientific value, and many well illustrated. There are altogether fifty-three papers and forty-five plates. Unfortunately for scientific readers having only a limited acquaintance with foreign languages, many of the papers are printed in Chech. Among the subjects dealt with are the Arachnida of Bohemia and Moravia, by Prof. A. Nosek; the chalk formation in the neighbourhood of Ripu, by Prof. V. Zahálka; the palæontology of the older palæozoic formations in Central Bohemia, by Dr. F. Katzer; new descriptions of Tubellaria, by Prof. F. Vejdovski; anemometer observations at Prague, by Dr. J. Frejlach; a contribution to the electromagnetic theory of light, by Prof. F. Koláček; monograph of the fossil flora of Rossitz, Moravia, by

Dr. F. Katzer; some curious geological effects produced by wind-borne sand, by Prof. J. N. Woldřich; the anatomy and development of the brain of vertebrates, by F. K. Studnička; the development of Stylomatophora, by J. F. Babor; determination of the altitude of the celestial pole by means of photography, by Prof. V. Láska; on *Baculus elongatus* (Lubbock) and *Lernæa branchialis*, a contribution to the anatomy of Lernæadæ, by A. Mrázek; studies of isopoda, by B. Némec; on electrolytic superoxide of silver, by Dr. O. Šulc; studies of the Coccidæ, by K. Šulc (this paper is summarised in English); the histology and histogenesis of the spinal cord, by Dr. F. K. Studnička; and new vertebrates from the Permian formation of Bohemia, by Prof. A. Fritsch.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, ♀) from India, presented by Mrs. Bouveri; two Slow Lorises (*Nycticebus tardigradus*), a —— Toad (*Bufo asper*) from Penang, a Roseate Cockatoo (*Cacatua roseicapilla*) from Australia, a Lesser Sulphur-crested Cockatoo (*Cacatua sulphurea*) from Moluccas, two Spinose Land Emys (*Geomyda spinosa*), a Black-spotted Toad (*Bufo melanostictus*) from Singapore, presented by Mr. Stanley S. Flower; two Hairy Armadillos (*Dasypus villosus*) from Uruguay, presented by Messrs. FitzHerbert, Bros.; a Coati (*Nasua rufa*) from South America, presented by Mr. Ernest Brocklehurst; two Herring Gulls (*Larus argentatus*), two Black-headed Gulls (*Larus ridibundus*) British, presented by Baron Ferdinand de Rothschild; a Javan Porcupine (*Hystrix javanica*, white var.) from Java, a Leopard Tortoise (*Testudo pardalis*), a Natal Python (*Python sebæ*, var. *natalensis*) from South Africa, a Cunningham's Skink (*Egernia cunninghami*) from Australia, deposited; a Japanese Deer (*Cervus sika*, ♂), a Red Deer (*Cervus elaphus*, ♀), two Thars (*Capra jemlaica*, ♀ ♀), a Huanaco (*Lama huanacos*, ♂), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

OCCULTATION OF JUPITER.—On the evening of June 14 there will be an occultation of Jupiter and his satellites. The planet will disappear at 9h. 52m. G.M.T. at an angle of 113° from the north point towards the east, and reappear at 10h. 43m. at the position angle 293°. The moon will be about three and a half days old, but as it will set at 10h. 56m. the reappearance will occur under unfavourable conditions of observation. The sun will pass below the horizon of Greenwich at 8h. 16m. on the 14th.

COMET SWIFT.—The following elements for comet Swift, 1896, have been derived by F. Bidschof (*Ast. Nach.*, No. 3356).

T = 1896 April 17·68237 (Berlin M.T.)

$$\left.\begin{array}{rl} \omega = & 1^\circ\ 43'\ 55''\!\cdot\!3 \\ \Omega = & 178\ \ 15\ \ 28\cdot 1 \\ i = & 55\ \ 33\ \ 42\cdot 8 \end{array}\right\} 1896\cdot 0$$

$$\log q = 9\cdot 753076$$

The following is a short ephemeris, the unit of brightness being that on April 19:—

	R.A. h. m. s.	Decl. ° ′	Brightness.
June 11	22 17 17	+72 43	0·05
15	21 52 31	72 21	0·05
19	21 29 5	71 46	0·04
23	21 7 20	70 57	0·03
27	20 47 29	69 57	0·03
July 1	20 29 38	+68 45	0·03

The last published observation is that of Dr. Engelhardt on May 11 (*Ast. Nach.*, No. 3353), when the comet was reported "faint."

SPOTS AND MARKINGS ON JUPITER.—During the past seventeen years Prof. Hough, of the Dearborn Observatory, has made an almost unbroken series of observations of the markings of Jupiter, with the special aim of studying the phenomena by means of micrometrical measures of size and position, rather than by sketches. He considers that for the proper interpretation of the changes taking place, such measurements, extending over a long period of time, are absolutely necessary, while the study of latitude variations is likely to lead to results as important as those of rotation period (*Ast. Nach.*, No. 3354). Photographs have been regarded as capable of giving results as accurate as micrometric measures in the telescope, but long experience has led Prof. Hough to doubt this conclusion. Notwithstanding its varying visibility, the size and shape of the great red spot have changed very little since 1879, though during recent years it was possibly 1″ shorter than when it was most conspicuous. The very slight change in the latitude of the spot during the last seventeen years seems to indicate that this object is the most stable of any of the markings. The average length of the spot, reduced to mean distance, has been 11″·61 or 37°·2. Measures of the equatorial belt and of several spots are also given, and it is worth noting that there are many advantages in Prof. Hough's method of expressing latitudes in direct measures of angular distance. A very suggestive observation was made on February 13, 1895. The third satellite was then observed in transit, at first as a black spot, but afterwards as a white disc; "after emersion, when the distance from the limb of the planet was 0″·4, the outline was sharply defined, and there was an absence of glow around the disc as though the satellite was immersed in a medium which absorbed some of its light."

COMET PERRINE-LAMP (1896 I.), which attracted considerable attention in the early part of the year, has probably now passed out of reach of even the largest telescopes. M. Schulhof has computed hyperbolic elements for this comet; but while the hyperbolic character of the orbit is still uncertain, it is established that the comet is not one of short period.

THE RELATIVE LENGTHS OF POST-GLACIAL TIME IN THE TWO HEMISPHERES.

SOME interesting observations on underground temperature have recently been made at Cremorne, near Port Jackson, in New South Wales.[1] The bore is 2939 feet deep, the mean temperature at the surface is 63° F., and the temperature at the depth of 2733 feet was found to be 97° F. The observations having been made with great care, the resulting gradient of 1° F. per 80 feet would appear to be "a good approximation to the truth." The rocks of the district down to a depth of about 3000 feet consist of sandstones, shales and conglomerates, and therefore, so far as conductivity is concerned, seem to be not unlike the rocks penetrated by the shafts of coal-mines in the north of England, or those in which Forbes' rock-thermometers were sunk in the neighbourhood of Edinburgh.

The estimates of the relative lengths of post-Glacial time in the two hemispheres, given on p. 138, are based on the following assumptions, the first three of which, it is needless to say, are only rough approximations to the truth. It is supposed (1) that in each hemisphere the gradient beneath the ice-sheet at the close of the Glacial period was the same[2]; (2) that the gradient at the surface may now be taken as equal to the average gradient over the whole boring; (3) that when the ice-sheet disappeared, the mean temperature of the district rose *suddenly* to its present value; and (4) that, previously to its disappearance, the temperature of the ground at the base of the ice-sheet was that of the freezing-point of water due to the pressure of the ice above, say 30°·5 F.[3]

The change in the gradient near the surface after a lapse of t years, due to a rise of b degrees in mean surface temperature, is $b/\sqrt{(\pi\kappa t)}$, where κ is the conductivity of rock expressed in terms of its own capacity for heat.[4] Now, the mean temperature over England averages 49°·5 F., so that b is here 19°, and the temperature gradient in the north of England is 1° per 49 feet.[5] Hence,

$$\frac{19}{\sqrt{t}} = \sqrt{(\pi\kappa)}\left(\frac{1}{x} - \frac{1}{49}\right),$$

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[1] Report of B. A. Underground Temperature Committee, 1895.

[2] This implies that the Glacial period was of the same—or, if not, of very great—length in each hemisphere.

[3] See a paper "On the Effect of the Glacial Period in changing the Underground Temperature Gradient" (*Geol. Mag.*, vol. ii., 1895, pp. 356-360).

[4] Rev. O. Fisher, *Phil. Mag.*, vol. xxxiv., 1892, p. 339.

[5] Sir J. Prestwich, "Controverted Questions of Geology," p. 203.